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| 09/909,497      | 07/20/2001  | Peter Bauerlein      | 1201-01             | 4174             |

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02/13/2003

IP Department  
Schnader Harrison Segal & Lewis  
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Philadelphia, PA 19103

EXAMINER

YUAN, DAH WEI D

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 02/13/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/909,497

Applicant(s)

BAUERLEIN, PETER

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

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**Ni/METAL HYDRIDE SECONDARY ELEMENT**

Examiner: Yuan

S.N. 09/909,497

Art Unit: 1745

February 3, 2003

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (US 6,225,004 B1) in view of Yano et al. (US 5,827,494).

With respect to claim 1, Hayashi teaches a nickel hydride battery comprising a hydrogen storage alloy as the negative electrode, an alkaline electrolyte and nickel hydroxide as the positive electrode. However, Hayashi does not teach the inclusion of an aluminum compound in the positive electrode. Yano et al. teach a nickel hydride battery having a positive electrode of nickel hydroxide. The surface of the hydroxide is covered with a mixed crystal of cobalt hydroxide and a hydroxide of at least one metal (M) selected from the group consisting of aluminum, magnesium, indium and zinc. The coating on the nickel hydroxide can maintain a long charge-discharge and increase the conductivity of the electrode. See Abstract, Column 3, Lines 8-20. Therefore, it would have been obvious to one of ordinary skill in the art to coat the positive electrode active material with aluminum hydroxide (which is soluble in the electrolyte) in the battery of Hayashi, because Yano et al. teach the use of aluminum hydroxide coating on the nickel hydroxide to improve the performance of the electrochemical cell.

With respect to claims 2-4, Yano et al. teach that it is desirable to adjust the composition of the solution of mixed crystal. The amount of the aluminum hydroxide in the mixed crystal on the composite particles is 0.5 to 50% by weight based on the total weight of the cobalt and aluminum contained in the mixed crystal. Also, the resulting composite particles contain 3 to 25% by weight of the mixed crystal. As a result, it is realized that the aluminum hydroxide in the positive electrode is in an amount of about 0.02 to 12.5%. In addition, Yano et al. teach the coating on the nickel hydroxide can maintain a long charge-discharge and increase the conductivity of the electrode. Therefore, it would have been obvious to one of ordinary skill in the art to coat the positive electrode active material with about 0.1 to about 2% aluminum hydroxide on the battery of Hayashi, because Yano et al. teach the use of aluminum hydroxide coating on the nickel hydroxide to improve the performance of the electrochemical cell.

With respect to claim 5, Hayashi teaches the positive electrode further comprises a plurality of additives including cobalt oxide and at least one secondary additive selected from the group consisting of  $\text{Ca(OH)}_2$ ,  $\text{CaF}_2$  and  $\text{Y}_2\text{O}_3$ . With respect to claim 6, Hayashi teaches the amount of the oxidic compound in the positive electrode is about 2%. With respect to claims 7 and 8, the common configurations for the nickel metal hydride battery include cylinder (such as an AA battery) and button as evidenced by David Linden (Handbook of Batteries, Second Edition, McGraw-Hill, Inc. page 33.4-33.5). With respect to claim 9, Hayashi teaches the secondary additive is at least one selected from the group consisting of  $\text{Ca(OH)}_2$ ,  $\text{CaF}_2$  and  $\text{Y}_2\text{O}_3$ . If  $\text{CaF}_2$  is added in the electrode mixture, the positive electrode is essentially free from  $\text{Ca(OH)}_2$  and/or  $\text{Yb}_2\text{O}_3$ .

With respect to claims 10 and 12, Hayashi teaches a nickel hydride battery comprising a hydrogen storage alloy as the negative electrode, an alkaline electrolyte and nickel hydroxide as the positive electrode. However, Hayashi does not teach the inclusion of an aluminum compound in the positive electrode. Yano et al. teach a nickel hydride battery having a positive electrode of nickel hydroxide. The surface of the hydroxide is covered with a mixed crystal of cobalt hydroxide and a hydroxide of at least one metal (M) selected from the group consisting of aluminum, magnesium, indium and zinc. The aluminum hydroxide can become soluble in the electrolyte upon charging. The coating on the nickel hydroxide can maintain a long charge-discharge and increase the conductivity of the electrode. Therefore, it would have been obvious to one of ordinary skill in the art to coat the positive electrode active material with aluminum hydroxide in the battery of Hayashi, because Yano et al. teach the use of aluminum hydroxide coating on the nickel hydroxide to improve the performance of the electrochemical cell. A method of forming an active positive electrode containing aluminum hydroxide in a battery is also taught.

With respect to claim 11, the disclosure of Hayashi and Yano et al., differs from Applicant's claims in that Hayashi and Yano et al. do not disclose the film thickness of the aluminum hydroxide. As mentioned above, the aluminum hydroxide in the positive electrode active material can be varied from 0.02 to 12.5%. Therefore, it would have been within the skill of the ordinary artisan to adjust the content of the aluminum hydroxide in the positive electrode in order to achieve a desirable thickness of about 0.03 to about 0.1  $\mu\text{m}$ . Where the general conditions of a claim are disclosed in the prior art it is not inventive to discover the optimum or

workable ranges by routine experimentation. In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.

See Hayashi reference: Abstract; Column 1, Lines 10-30; Column 2, Lines 35-48; Column 4, Lines 35-43; Column 5, Lines 19-25; Claims 1-3. See Yano reference: Abstract, Column 3, Lines 8-20.

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kawakami (US 6,329,101 B1) teach the use of aluminum oxide as additive in the hydrogen storing compound (negative electrode) of a nickel metal hydride battery.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan  
February 6, 2003

  
**Patrick Ryan**  
**Supervisory Patent Examiner**  
**Technology Center 1700**